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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,098	11/03/2003	Aoi Tanaka	10873.1321US01	2814

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EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

MAIL DATE	DELIVERY MODE
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07/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/700,098

Applicant(s)

TANAKA ET AL.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-13,16 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-13,16,19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

FUEL CELL

Examiner: Yuan S.N. 10/700,098 Art Unit: 1745 July 13, 2007

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 8, 2007 has been entered. Claims 8,14,15 were canceled. Claim 1 was amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on August 17, 2006.

Information Disclosure Statement

3. The information disclosure statement filed March 26, 2007 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has

been placed in the application file, but the information referred to therein has not been considered.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

5. The claim rejections under 35 U.S.C. 102(e) as anticipated by Gyoten et al. on claims 1-14,16,19 are withdrawn, because the independent claim 1 has been amended.
6. The claim rejections under 35 U.S.C. 102(b) as anticipated by Stonehart et al. on claims 1,12-15 are withdrawn, because the independent claim 1 has been amended.

Claim Rejections - 35 USC § 103

7. Claims 1-7,9-13,16,19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gyoten et al. (US 6,746,793 A1) in view of Stonehart et al. (US 5,523,181).

With respect to claims 1,10, Gyoten et al. disclose a polymer electrolyte fuel cell comprising a pair of electrodes having each a catalytic reaction layers, the electrodes sandwiching a polymer electrolyte membrane wherein a hydrogen ion diffusion layer is provided on either surface of a catalyst particle. The hydrogen ion diffusion layer can be formed by

chemically bonding a silane compound to the surface of the catalyst particle or the catalyst particle. However, Gyoten et al. do not disclose the addition of other particles in the catalyst layer. Stonehart et al. teach a polymer electrolyte assembly wherein the cathode catalyst layer and the anode catalyst layer comprising platinum, NAFION and silica. The additional of silica in the cathode catalyst layer can prevent water generated by the electrode reaction on the cathode catalyst layer from vaporizing into the gas phase. The addition of silica in the anode catalyst layer can prevent the anode from drying and promote reverse transport of water from the cathode side to the anode side. See Column 5, Lines 51 to Column 6, Line 13, Example 2. Therefore, it would have been obvious to one of ordinary skill in the art to add silica to the catalyst layers of Gyoten et al., because Stonehart et al. teach use of silica to improve the performance of the resulting fuel cells.

Moreover, the combined references do not specifically disclose the silane is chemically bonded to the surface of the silica particle via an oxygen atom. However, it is the position of the examiner that such characteristics are inherent, given that Gyoten and Stonehart utilize the same molecular compound and silica particles in the forming of catalyst layers. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 2, Gyoten et al. disclose the mean molecular weight of silane compound is 40-10,000. See Column 19, Lines 10-55.

With respect to claim 3, Gyoten et al. disclose the silane compound has a functional group capable of dissociating a hydrogen ion at the end and has at least one of a hydrocarbon chain and a fluorocarbon chain. See Column 15, Lines 46-50.

With respect to claims 4-6, Gyoten disclose a hydrolysable group that converts into an activated silanol group and reacts with an oxide on the surface, which permits formation of a covalent bond. The silane compound has a hydrogen ion dissociating functional group such as sulfonic group or carboxyl group. See Column 16, Lines 6-14.

With respect to claim 7, Gyoten et al. disclose that by making this silane compound having a basic functional group containing a nitrogen atom having a lone pair at the end, for example, an amid group or an amine group, mutual reaction with a polymer electrolyte having a residual group of an acid such as sulfonic acid can be caused. See Column 17, Lines 44-49.

With respect to claim 9, Gyoten et al. disclose conducting HCl elimination reaction with $-\text{SiCl}_3$ group, $-\text{OH}$ group or other function group or oxide, a monomolecular adsorption film is formed with a silane compound on the surface of the catalyst or on the surface of the carbon carrier. See Column 18, Line 63 to Column 19, Line 1.

With respect to claim 11, Gyoten et al. disclose the use of platinum particle as the catalyst. See Column 18, Lines 55-56.

With respect to claims 12,13,16, Gyoten et al. disclose the use of carbon powder in the catalyst layer that is an electron conductor. The carbon powder has an average diameter of 2 to 10 microns. See Column 9, Lines 22,23.

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With respect to claim 19, Gyoten et al. disclose the catalyst having a thickness of 30-100 microns. See Column 1, Lines 43,44.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
July 16, 2007



DAH-WEI YUAN
PRIMARY EXAMINER